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13. ABSTRACT (Maximum 200 words) A BIOLOGICAL MONITORING PROGRAM WAS BEGUN ON ROCKY MOUNTAIN ARSENAL (RMA) IN 1977. PHASE I OF THIS PROGRAM WAS A SCREENING STUDY TO DETERMINE THE GENERAL EXTENT OF CONTAMINANTS IN THE BIOTA. SOME OF THE RESULTS OF THIS STUDY INDICATED THAT THE FISH AND GAME ANIMALS ON RMA WERE TAKING UP CONTAMINANTS. SINCE THE SCREENING STUDY IN 1977, THE FISH AND SMALL GAME ANIMALS HAVE BEEN SAMPLED ANNUALLY TO MONITOR THEIR STATUS OF CONTAMINATION. THE TABLES PRESENT THE RESULTS OF THESE STUDIED TO DATE. SAMPLES OF OFF-POST GAME BIRDS FOR COMPARISON WITH RMA BIRDS WERE TAKEN IN 1980, 1981, AND 1982. THOSE FOR 1980 AND 1981 ARE DESIGNATED AS "CONTROLS" IN THE TABLE. SAMPLING LOCATIONS WERE SELECTED RATHER THAN RANDOMIZED.				

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Contaminants in Fish and Game Animals
on Rocky Mountain Arsenal 1977 - 1982

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David S. Thorne

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Rocky Mountain Arsenal
Information Center
Commerce City, Colorado

December 1982

Contaminants in Fish and Game Animals on Rocky Mountain Arsenal
Results of Chemical Analyses 1977 to 1982

A biological monitoring program was begun on Rocky Mountain Arsenal (RMA) in 1977. Phase I of this program was a screening study to determine the general extent of contaminants in the biota. Some of the results of this study indicated that the fish and game animals on RMA were taking up contaminants.

Since the screening study in 1977, the fish and small game animals have been sampled annually to monitor their status of contamination. The following tables present the results of these studies to date. Deer were not routinely sampled. Deer samples taken since 1977 were obtained from fresh road kills and injured animals. These analyses are summarized in one table. Cottontail rabbits were not sampled in 1978. The only fish samples taken in 1978 were fourteen Rainbow trout from Lake Mary.

Samples of off-post game birds for comparison with RMA birds, were taken in 1980, 1981, and 1982. Those for 1980 and 1981 are designated as "controls" in the tables.

Sampling locations were selected rather than randomized and statistical analyses are not presented for the game birds or cottontails since, in most cases, only one or two samples were taken at any one location. Analyses are given for the fish samples where sufficient samples were taken at each location to justify a statistical analysis.

1977

Rocky Mountain Arsenal
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Commerce City, Colorado

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1/
Contaminants in Pheasants on RMA - 1977

<u>Location</u>	<u>No. of Birds</u>	<u>Tissue</u> ^{2/}	<u>Contaminant (ug/g)</u> ^{3/}				
			<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>	<u>DDE</u>	<u>DDT</u>
Sects 1 & 2	3	EDP	0.11	BDL	-	0.03	BDL
"	"	FEA	-	-	BDL	-	-
Sect 8	3	EDP	0.04	BDL	-	BDL	BDL
"	"	FEA	-	-	BDL	-	-
Sect 24	3	EDP	0.04	BDL	-	0.04	BDL
"	"	FEA	-	-	BDL	-	-
Sect 26	1	EDP	0.17	0.32	-	0.32	0.08
"	"	FEA	-	-	0.20	-	-
Sect 36	2	EDP	0.20	0.37	-	0.22	0.11
"	"	FEA	-	-	0.20	-	-

1/ Taken 1 - 3 Nov 77

2/ EDP (edible portion) = breast and leg meat; FEA = feathers

<u>3/ Contaminants</u>	<u>Symbol</u>	<u>Detection Level (ppm)</u>
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfone	CPM02	0.20
Chlorophenylmethylsulfoxide	CPMSO	0.20
Dichlorodiphenyltrichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

ALDN, CPM02, CPMSO, DIMP, DITH, ISOD and OXAT in edible portion and AS and CD in feathers were below detectable levels (BDL).

1/

Contaminants in Breast Meat of Mourning Doves on RMA - 1977

<u>Location</u>	<u>No. of Birds</u>	<u>Contaminant (ug/g)</u> ^{2/}		
		<u>DLDN</u>	<u>ENDN</u>	<u>DDE</u>
Sects 1,2,6,12	6	0.08	BDL	0.03
Sects 8,9	6	0.14	BDL	0.17
Sect 24	5	1.23	BDL	0.03
Sect 26	5	1.01	0.14	BDL
Sect 36	3	0.53	BDL	0.04

1/ Taken 4 - 15 Aug 77

<u>2/ Contaminants</u>	<u>Symbol</u>	<u>Detection Level (ppm)</u>
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfone	CPM02	0.20
Chlorophenylmethylsulfoxide	CPMSO	0.20
Dichlorodiphenyldrichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

ALDN, CPM02, CPMSO, DDT, DIMP, DITH, ISOD and OXAT in breast meat and AS, CD and HG in feathers were below their detectable levels (BDL).

1/

Contaminants in Waterfowl on RMA - 1977

3/

Contaminant (ug/g)

Water	Species	No. of Birds	Tissue	2/									
				ALDN	CPMSO	DIMP	DLDN	ENDN	HG	ISOD	DDE	DDT	
Lower Derby	Mallard	3	EDP	0.20	BDL	BDL	4.27	BDL	-	0.13	0.47	0.96	
"	"	"	FEA	-	-	-	-	-	BDL	-	-	-	
Ladora	"	"	EDP	BDL	BDL	BDL	0.40	0.15	-	BDL	0.39	0.08	
"	"	"	FEA	-	-	-	-	-	BDL	-	-	-	
R&G Pond	"	"	EDP	BDL	BDL	BDL	0.08	BDL	-	BDL	0.14	BDL	
"	"	"	FEA	-	-	-	-	-	BDL	-	-	-	
Lower Derby	G.B.Heron	1	EDP	BDL	0.24	0.05	1.23	0.29	-	BDL	0.52	0.20	
"	"	"	FEA	-	-	-	-	-	2.20	-	-	-	
R&G Pond	"	"	EDP	BDL	BDL	0.06	6.20	1.54	-	BDL	2.91	1.54	
"	"	"	FEA	-	-	-	-	-	2.00	-	-	-	
"	"	"	EDP	BDL	BDL	0.05	BDL	0.77	-	0.09	1.43	0.70	
"	"	"	FEA	-	-	-	-	-	1.00	-	-	-	

1/ Taken 26 Jul - 4 Aug 77

2/ EDP (edible portion) = breast and leg meat; FEA = feathers

3/ Contaminants	Symbol	Detection Level (ppm)
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfone	CPM02	0.20
Chlorophenylmethylsulfoxide	CPMSO	0.20
Dichlorodiphenyldrichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

CPM02, DITH and OXAT in edible portion and AS and CD in feathers were below their detectable levels (BDL).

4/ Pen-reared and wing-clipped. Placed on lakes for three months.

Dieldrin in Muscle Tissue of Cottontail Rabbits from RMA - 1977*

<u>Location</u>	<u>No. of Rabbits</u>	<u>ug/g Dieldrin</u>
Sect 2	3	0.44
Sect 8	1	0.04
Sect 26	3	0.37
Sect 36	3	0.21

* Taken 18 - 28 Oct 77. Aldrin, chlorophenylmethylsulfone, chlorophenylmethylsulfoxide, DDE, DDT, diisopropylmethylphosphonate (DIMP), dithiane, endrin, isodrin and oxathiane in muscle tissue; and arsenic, cadmium and mercury in skin and fur were below detectable levels.

1/
2/

Contaminants in Filets of Fish from RMA - 1977

<u>Water</u>	<u>Species</u>	<u>No. of Fish</u>	<u>Contaminant (ug/g)</u>						
			<u>ALDN</u>	<u>DIMP</u>	<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>	<u>DDE</u>	<u>DDT</u>
Lower Derby	L.M. Bass	2	0.04	0.06	0.89	BDL	-	0.12	BDL
"	Bl. Bullhead	2	0.29	0.06	3.19	0.17	BDL	0.11	0.03
Ladora Chan'l	L.M. Bass	2	BDL	0.09	0.51	BDL	0.40	0.15	BDL
"	Bl. Bullhead	2	0.06	0.09	0.69	0.08	BDL	0.10	BDL
TGY Pond	L.M. Bass	2	BDL	BDL	0.26	0.04	0.38	BDL	0.02
"	Bl. Bullhead	2	BDL	BDL	0.20	0.04	BDL	0.03	0.02
Lake Mary	Ch. Catfish	1	BDL	BDL	0.22	0.04	BDL	BDL	BDL

1/ Taken 5 Aug - 6 Oct 77

<u>2/ Contaminants</u>	<u>Symbol</u>	<u>Detection Level (ppm)</u>
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfone	CPM02	0.20
Chlorophenylmethylsulfoxide	CPMSO	0.20
Dichlorodiphenyldrichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

AS, CD, CPM02, CPMSO, DITH, ISOD and OXAT were below detectable levels (BDL).

1978

Chlorophenylmethylsulfide in Breast and Leg Meat of Pheasants

from RMA - 1978 *

<u>Location</u>	<u>ug/g PCPMS</u>
Sect 1	BDL
Sect 23	0.90
Sect 23	1.21
Sect 24	0.25
Sect 25	0.69

* Taken 6 - 29 Nov 78. Aldrin, Chlorophenylmethylsulfone, Chlorophenylmethylsulfoxide, Dibromochloropropane, Diisopropylmethylphosphonate (DIMP), Dithiane, Dieldrin, Endrin, Isodrin, Oxathiane, Arsenic, Cadmium and Mercury were below detectable levels (BDL).

Dieldrin in Breast Meat of Mourning Doves

from RMA - 1978 *

<u>Location</u>	<u>ug/g Dieldrin</u>
Sect 2	0.07
Sect 8	BDL
Sect 8	BDL
Sect 9	BDL
Sect 24	0.03
Sect 26	BDL

* Taken 21 Aug 78. Aldrin, Chlorophenylmethylsulfone, Chlorophenylmethylsulfoxide, Chlorophenylmethylsulfide, Dibromochloropropane, Diisopropylmethylphosphonate (DIMP), Dithiane, Endrin, Isodrin, Oxathiane, Arsenic, Cadmium and Mercury were below detectable levels (BDL).

Contaminants in Breast and Leg Meat of Ducks from RMA - 1978

1/

2/

<u>Location</u>	<u>Species</u>	<u>Contaminant (ug/g)</u>						
		<u>ALDN</u>	<u>CPM02</u>	<u>CPMS0</u>	<u>DBCP</u>	<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>
Upper Derby	Mallard	BDL	BDL	BDL	BDL	2.55	BDL	BDL
"	"	2.03	BDL	BDL	BDL	BDL	BDL	BDL
"	"	BDL	BDL	BDL	BDL	0.38	BDL	BDL
"	B.W. Teal	BDL	BDL	BDL	0.06	0.07	BDL	0.30
Ladora Chan'l	Mallard	BDL	BDL	BDL	BDL	0.66	BDL	BDL
North Bog	"	BDL	0.31	BDL	BDL	0.63	BDL	BDL
"	"	BDL	0.24	BDL	BDL	0.28	BDL	BDL
"	"	BDL	0.51	BDL	BDL	0.20	BDL	BDL
"	B.W. Teal	BDL	BDL	1.30	BDL	3.09	0.11	BDL

1/ Taken 13 - 19 May 78.

<u>2/ Contaminant</u>	<u>Symbol</u>	<u>Detection Level (ppm)</u>
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfide	PCPMS	0.20
Cpm-sulfone	CPM02	0.20
Cpm-sulfoxide	CPMS0	0.20
Dibromochloropropane	DBCP	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

AS, CD, PCPMS, DIMP, DITH, ISOD and OXAT were below detectable levels (BDL).

1/

Contaminants in Breast and Leg Meat of Ducks from RMA - 1978

2/

<u>Location</u>	<u>Species</u>	<u>Contaminant (ug/g)</u>						
		<u>ALDN</u>	<u>CPM02</u>	<u>CPMS0</u>	<u>DBCP</u>	<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>
Upper Derby	Mallard	BDL	BDL	BDL	BDL	2.55	BDL	BDL
"	"	2.03	BDL	BDL	BDL	BDL	BDL	BDL
"	"	BDL	BDL	BDL	BDL	0.38	BDL	BDL
"	B.W. Teal	BDL	BDL	BDL	0.06	0.07	BDL	0.30
Ladora Chan'l	Mallard	BDL	BDL	BDL	BDL	0.66	BDL	BDL
North Bog	"	BDL	0.31	BDL	BDL	0.63	BDL	BDL
"	"	BDL	0.24	BDL	BDL	0.28	BDL	BDL
"	"	BDL	0.51	BDL	BDL	0.20	BDL	BDL
"	B.W. Teal	BDL	BDL	1.30	BDL	3.09	0.11	BDL

1/ Taken 13 - 19 May 78.

<u>2/ Contaminant</u>	<u>Symbol</u>	<u>Detection Level (ppm)</u>
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfide	PCPMS	0.20
Cpm-sulfone	CPM02	0.20
Cpm-sulfoxide	CPMS0	0.20
Dibromochloropropane	DBCP	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

AS, CD, PCPMS, DIMP, DITH, ISOD and OXAT were below detectable levels (BDL).

Contaminants in Filets of Rainbow Trout

1/
from Lake Mary - 1978

2/
Contaminant (ug/g)

	<u>ALDN</u>	<u>CD</u>	<u>DBCP</u>	<u>DIMP</u>	<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>	<u>DDE</u>	<u>DDT</u>
	BDL	BDL	0.04	BDL	0.11	BDL	BDL	0.03	BDL
	BDL	BDL	0.02	BDL	0.12	BDL	0.25	0.02	BDL
	BDL	BDL	0.12	BDL	0.11	BDL	0.25	0.05	BDL
	0.05	1.62	0.09	BDL	0.50	0.05	0.20	0.25	BDL
	BDL	BDL	BDL	BDL	0.11	0.02	0.25	0.08	0.40
	BDL	1.52	0.55	BDL	0.50	BDL	0.25	0.07	BDL
	BDL	BDL	BDL	BDL	0.32	0.03	0.20	0.07	BDL
	BDL	1.01	BDL	BDL	0.16	0.02	0.20	0.08	0.03
	0.05	BDL	BDL	0.17	0.57	0.11	0.20	0.38	0.03
	BDL	BDL	0.03	BDL	0.16	BDL	0.25	0.04	BDL
	0.03	BDL	BDL	BDL	0.34	0.03	0.20	0.08	BDL
	BDL	BDL	0.04	BDL	0.07	BDL	0.20	0.05	0.03
	0.06	BDL	0.04	BDL	0.22	0.03	0.20	0.09	0.04
	BDL	BDL	0.05	BDL	0.22	0.03	BDL	0.06	0.03
Mean	0.014	0.296	0.070	0.012	0.251	0.023	0.189	0.096	0.040
Std. Error	0.006	0.161	0.038	0.012	0.045	0.008	0.022	0.026	0.028

1/ Stocked prior to Jul 77; caught Mar 78

2/ <u>Contaminants</u>	<u>Symbol</u>	<u>Detection Level (ppm)</u>
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfide	PCPMS	0.20
Cpm-sulfone	CPM02	0.20
Cpm-sulfoxide	CPMSO	0.20
Dibromochloropropane	DBCP	0.02
Dichlorodiphenyltrichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

AS, PCPMS, CPM02, CPMSO, DITH, ISOD and OXAT were below detectable levels (BDL).

1979

TABLE 1. Contaminants in Game Animals (Edible Portion) - 1979

Species	Location	CPM02	CPMS0	Contaminant (ppm)*				OXAT	PCPMS	DDE	DDT
				DLDN	ENDN	HG	ISOD				
Pheasant	Section 6	14.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.02	BDL
"	" 24	BDL	BDL	0.04	BDL	BDL	BDL	BDL	BDL	BDL	0.07
"	" 30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 2	BDL	BDL	0.04	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.03	BDL
Mourning Dove	" 26	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.06	BDL
"	" 9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.04	BDL
"	" 9	BDL	BDL	BDL	BDL	BDL	0.02	BDL	BDL	0.13	0.04
"	" 36	BDL	BDL	1.81	0.05	BDL	BDL	BDL	BDL	BDL	0.05
"	" 36	BDL	BDL	0.23	0.03	BDL	BDL	BDL	BDL	BDL	0.05
Mallard	Sewage Pond	BDL	0.20	3.58	BDL	1.20	BDL	0.20	BDL	BDL	BDL
"	" "	BDL	0.24	2.84	BDL	2.40	BDL	0.20	BDL	BDL	BDL
"	Lake Mary	BDL	0.25	0.70	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	"	BDL	0.26	0.20	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	"	BDL	0.26	BDL	BDL	BDL	BDL	BDL	0.04	BDL	BDL
Bl.W. Teal	Upper Derby	BDL	BDL	0.18	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cottontail	Section 27	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 27	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 1	BDL	BDL	0.04	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 1	BDL	BDL	0.03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
"	" 1	BDL	BDL	0.03	BDL	BDL	BDL	BDL	BDL	BDL	BDL

*CPM02 = Chlorophenylmethylsulfone; CPMSO = CPM sulfoxide; DLDN = Dieldrin; ENDN = Endrin; HG = Mercury; ISOD = Isodrin; OXAT = Oxathiane; PCPMS = CPM sulfide.

Aldrin, Arsenic, Cadmium, Dibromochloropropane (DBCP), Diisopropylmethylphosphonate (DIMP) and Dithiane were all Below Detectable Limits (BDL).

TABLE II. Contaminants in Fish (Edible Portion) - 1979*

SPECIES	LOCATION	CONTAMINANT (ppm)					
		ALDN	DLDN	ENDN	HG	DDE	DDT
Rainbow Trout	Lake Mary	BDL	BDL	BDL	BDL	BDL	BDL
	"	BDL	0.06	BDL	BDL	0.05	BDL
	"	BDL	0.04	BDL	BDL	0.05	BDL
	"	BDL	0.05	BDL	BDL	0.06	BDL
	"	BDL	0.04	BDL	BDL	0.05	BDL
	"	BDL	0.04	BDL	BDL	0.04	BDL
	"	BDL	0.05	BDL	BDL	0.04	BDL
	"	BDL	BDL	BDL	0.25	0.17	BDL
	"	BDL	BDL	BDL	0.32	0.08	BDL
	"	0.04	0.10	BDL	BDL	0.05	BDL
	"	0.04	0.03	BDL	0.26	0.05	BDL
	"	BDL	0.03	BDL	BDL	0.02	BDL
	"	0.04	0.06	BDL	0.21	0.07	BDL
	"	0.04	0.06	BDL	0.21	0.07	BDL
Bass	Lake Ladora	BDL	0.19	BDL	BDL	BDL	BDL
	"	BDL	0.13	BDL	BDL	BDL	BDL
	"	BDL	0.12	BDL	BDL	BDL	BDL
	"	BDL	0.11	BDL	BDL	BDL	BDL
	"	BDL	0.06	BDL	BDL	BDL	BDL
	"	BDL	0.07	BDL	BDL	BDL	BDL
	Lower Derby	0.03	0.49	0.03	BDL	BDL	BDL
	"	0.02	0.24	0.02	BDL	BDL	BDL
	"	0.04	0.48	BDL	BDL	BDL	BDL
	"	0.03	0.50	BDL	BDL	BDL	BDL
	"	0.03	0.29	BDL	BDL	BDL	BDL
	"	0.05	0.50	BDL	BDL	BDL	BDL
	"	0.05	0.50	BDL	BDL	BDL	BDL
	"	0.05	0.50	BDL	BDL	BDL	BDL
N. Pike	Lake Ladora	BDL	0.05	BDL	BDL	0.10	0.03
	"	BDL	0.12	BDL	BDL	0.11	0.03
	"	BDL	0.06	BDL	BDL	0.05	BDL
	"	BDL	0.04	BDL	BDL	0.03	BDL
	"	BDL	0.04	BDL	BDL	BDL	BDL
	Lower Derby	BDL	0.25	BDL	BDL	0.03	BDL
	"	BDL	0.53	0.50	BDL	BDL	0.03
	"	BDL	0.15	BDL	BDL	0.03	BDL
	"	BDL	0.39	0.40	BDL	0.06	0.03
	"	BDL	0.13	BDL	BDL	0.06	BDL
	"	BDL	0.13	BDL	BDL	0.06	BDL

TABLE II (continued).

Bullhead	Lake Ladora	BDL	0.11	BDL	BDL	BDL	BDL
"	"	BDL	0.11	BDL	BDL	BDL	BDL
"	"	BDL	0.10	BDL	BDL	0.10	EDL
"	"	BDL	0.16	0.03	BDL	0.09	BDL
"	"	BDL	0.20	0.03	BDL	0.10	0.03
"	"	BDL	0.09	BDL	BDL	0.06	BDL
"	Lower Derby	BDL	0.31	0.03	BDL	0.04	BDL
"	"	BDL	0.48	0.05	BDL	0.10	EDL
"	"	BDL	0.29	0.03	BDL	0.08	EDL
"	"	BDL	0.65	0.05	BDL	EDL	0.04
"	"	BDL	0.40	0.04	BDL	0.07	0.06
"	"	BDL	0.21	BDL	BDL	0.05	0.05

* All fish were caught in May 1979. The Rainbow trout were planted Lake Mary between November 1977 and September 1978.

ALDN = Aldrin; DLDN = Dieldrin; ENDN = Endrin; and HG = Mercury.

Arsenic, Cadmium, Chlorophenylmethyl sulfone, CPM-sulfoxide, CPM-sulfide, Dibromochloropropane, Dithiane, Isodrin, Oxathiane and Diisopropylmethylphosphonate were all Below Detectable Limits (BDL).

1980

TABLE 1. Contaminants in Breast and Leg Meat of Pheasants from RMA - 1980

<u>LOCATION</u> ^{2/}	<u>CONTAMINANT (ppm)</u> ^{1/}							
	<u>CPM02</u>	<u>DBCP</u>	<u>DDE</u>	<u>DDT</u>	<u>DIMP</u>	<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>
Section 06-02	BDL	BDL	BDL	BDL	BDL	0.54	BDL	BDL
07-06	BDL	BDL	0.27	0.03	BDL	BDL	BDL	BDL
23-02	BDL	0.03	BDL	BDL	BDL	BDL	BDL	ND
24-10	BDL	0.03	BDL	BDL	BDL	BDL	BDL	BDL
24-10	BDL	BDL	BDL	BDL	BDL	0.15	BDL	0.38
24-15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24-15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26-14	1.90	BDL	0.19	0.09	1.54	0.96	0.09	BDL
30-05	BDL	BDL	0.08	BDL	BDL	0.06	0.04	BDL
30-09	BDL	BDL	0.10	BDL	BDL	BDL	BDL	BDL

- ^{1/} CPM02 = Chlorophenylmethyl sulfone
 DBCP = Dibromochloropropane (Nemagon)
 DDE = Dichlorodiphenyldichloroethylene
 DDT = Dichlorodiphenyltrichloroethane
 DIMP = Diisopropylmethylphosphonate
 DLDN = Dieldrin
 ENDN = Endrin
 HG = Mercury
 BDL = Below detectable level
 ND = Not done

Aldrin (ALDN), arsenic (AS), cadmium (CD), chlorophenylmethyl sulfide (PCPMS), chlorophenylmethyl sulfoxide (CPMSO), dithiane (DITH), Isodrin (ISOD), and oxathiane (OXAT) were below detectable levels.

^{2/} Locations:

- Section 06-02 = Shoreline on arm of Upper Derby lake.
 Section 07-06 = Bank of Highline canal.
 Section 23-02 = North of 9th Ave, north of Basin F.
 Section 24-10 = North of sewage lagoon.
 Section 24-15 = Woodland east of bog.
 Section 26-14 = Immediately north of Basin F.
 Section 30-05 = East of E street.
 Section 30-09 = East of E street (north of 30-05).

TABLE II. Contaminants in Breast and Leg Meat of Pheasant Controls -1980

<u>LOCATION</u>	<u>CONTAMINANT (ppm) */</u>				
	<u>ALDN</u>	<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>	<u>ISOD</u>
Larimer County, CO	0.05	0.03	BDL	5.0	BDL
" "	0.13	0.14	0.10	BDL	0.09
Weld County, CO	BDL	BDL	BDL	BDL	BDL
" "	0.05	BDL	BDL	BDL	BDL
" "	0.04	BDL	BDL	BDL	BDL

*/ AS, CD, CPMO2, DBCP, DDE, DDT, DIMP, DITH, OXAT, CPMSO, and PCPMS were below detectable levels. (See Table I for abbreviations)

TABLE III. Contaminants in Breast Meat of Mourning Doves from RNA - 1980

<u>LOCATION</u> ^{2/}	<u>CONTAMINANT (ppm) ^{1/}</u>							
	<u>ALDN</u>	<u>DDE</u>	<u>DDT</u>	<u>DIMP</u>	<u>DLDN</u>	<u>ENDN</u>	<u>ISOD</u>	<u>PCPMS</u>
Section 02-07	BDL	0.53	BDL	BDL	0.61	BDL	0.13	BDL
02-07	0.05	0.19	0.08	BDL	0.31	0.42	0.16	0.22
09-02	0.09	0.55	BDL	BDL	BDL	0.14	0.14	1.46
09-02	0.03	0.62	BDL	BDL	BDL	0.19	0.14	0.75
12-14	BDL	0.10	BDL	BDL	0.07	0.10	0.11	0.20
12-14	0.07	0.24	BDL	BDL	0.27	0.20	0.22	BDL
23-02	0.03	0.24	BDL	0.10	0.57	0.25	BDL	0.30
23-02	0.03	0.13	0.10	BDL	0.23	0.20	BDL	BDL
24-15	0.05	0.15	BDL	BDL	0.09	0.08	0.14	0.20
24-15	0.04	0.08	BDL	BDL	0.09	0.10	BDL	BDL

^{1/} AS, CD, CPMO2, CPMSO, DBCP, DITH, HG and OXAT were below detectable levels. (See Table I for abbreviations)

^{2/} Locations:

Section 02-07 = Between Lake Ladora and Shell plant.

09-02 = Locust thicket east of post office buildings.

12-14 = Locust thicket southwest of Rod & Gun club.

23-02 = Fence north of Basin F.

24-15 = Trees east of bog.

TABLE IV. Contaminants in Breast Meat of Mourning Dove Controls - 1980

LOCATION	CONTAMINANT (ppm) */				
	ALDN	DDE	DDT	ENDN	ISOD
Adams County, CO	0.05	BDL	BDL	BDL	BDL
"	BDL	BDL	BDL	BDL	BDL
"	BDL	BDL	BDL	BDL	BDL
"	0.06	BDL	BDL	BDL	BDL
"	0.12	0.40	0.09	0.16	0.10

*/ AS, CD, CPMO2, CPMSO, DBCP, DIMP, DITH, DLON, HG, OXAT and PCPMS were below detectable levels. (See Table I for abbreviations)

TABLE V. Contaminants in Breast and Leg Meat of Ducks from RMA - 1980

LOCATION	SPECIES	CONTAMINANT (ppm) */						
		ALDN	DBCP	DDE	DDT	DLON	ENDN	HG
Rod & Gun Club Pond	Mallard	0.05	BDL	BDL	BDL	0.10	0.07	21.80
"	B.W. Teal	0.16	BDL	BDL	0.12	0.41	0.23	8.90
Upper Derby Lake	" "	0.10	BDL	BDL	0.19	0.45	0.11	2.10
"	" "	0.17	BDL	BDL	BDL	0.68	0.10	5.30
"	" "	0.12	0.36	0.07	BDL	0.12	BDL	2.10
"	Mallard	0.11	0.51	BDL	BDL	0.53	0.06	3.80
"	" "	0.18	BDL	BDL	BDL	0.79	0.16	0.94
"	" "	BDL	0.03	BDL	0.70	0.73	0.18	0.29
Sewage Pond	" "	BDL	BDL	BDL	BDL	0.08	0.03	1.10
"	" "	BDL	BDL	BDL	BDL	0.21	0.07	0.94

*/ AS, CD, CPMO2, CPMSO, DIMP, DITH, ISOD, OXAT and PCPMS were below detectable levels. (See Table I for abbreviations)

TABLE VI. Contaminants in Breast and Leg Meat of Duck Controls - 1980

<u>SPECIES</u>	<u>LOCATION</u>	<u>AGE</u>	<u>SEX</u>	<u>CONTAMINANTS (ppm) */</u>	
				<u>DDE</u>	<u>DDT</u>
Mallard	Banner Lake	Ad	F	BDL	BDL
" "	" "	" "	" "	0.03	BDL
" "	" "	" "	M	BDL	BDL
" "	" "	" "	" "	BDL	BDL
" "	" "	" "	" "	0.05	0.08

*/ ALDN, AS, CD, CPMO2, CPMSO, DBCP, DIMP, DITH, DLDN, ENDN, HG, ISOD, OXAT, and PCPMS were below detectable levels, (see table 1 for abbreviations).

TABLE VIII. Contaminants in Edible Portion (Filets) of Fish from RMA - 1980 /1

Lake	Species	No.	Weight (g)	Contaminants (ppm) /2							
				ALDN	AS	DLDN	ENDN	HG	ISOD	DDE	DDT
Lower Derby	L.M. Bass	1	612	.31	BDL	.46	.04	.38	BDL	BDL	.07
	N. Bluegill	1	436	BDL	"	BDL	.03	.36	"	.37	BDL
	N. Pike	1	390	"	"	"	BDL	.64	"	BDL	"
	"	1	448	"	"	"	"	.28	"	"	"
	"	1	268	"	"	.07	.04	.29	"	"	"
	B1. Bullhead	1	279	"	"	BDL	BDL	.28	"	"	"
	"	1	257	"	"	.12	"	.28	"	"	"
	"	1	273	.03	"	.44	.03	.24	"	.05	"
	"	1	280	BDL	"	BDL	BDL	.22	"	BDL	"
	"	1	268	"	"	"	"	.22	"	.05	"
	"	1	223	.28	"	.12	"	.31	"	BDL	"
	"	1	220	.06	"	.12	.14	.27	"	.11	.02
	"	1	241	.03	"	.12	BDL	.31	.03	BDL	.03
	"	1	215	.04	"	.06	"	.21	.02	.12	BDL
	"	1	245	.04	"	.27	"	.31	BDL	BDL	.04
	Ladora	L.M. Bass	2	128/31	BDL	"	.03	"	.26	"	"
"		1	153	"	"	.03	"	1.33	"	"	"
"		1	582	"	"	.05	"	1.77	"	"	"
"		1	540	"	"	.05	"	15.3	"	"	"
N. Bluegill		3	34/80/71	"	"	.05	"	.78	"	"	"
"		3	109/109/69	"	"	.04	"	.70	"	"	"
"		3	102/92/64	"	"	.03	"	.74	"	"	"
"		3	63/61/52	"	"	.05	"	.68	"	"	"
B1. Bullhead		1	274	"	"	.15	"	.56	"	"	"
"		1	277	"	"	.40	.03	.38	"	"	"
"		1	261	"	"	.06	BDL	BDL	"	"	"
"		1	303	"	"	.10	"	"	"	"	"
"		1	273	"	"	.05	"	"	"	"	"
"		1	306	"	"	.13	"	"	"	"	"
"		1	302	"	"	.26	.03	.29	"	"	"
"		1	284	"	"	.11	BDL	BDL	"	"	"
"		1	240	"	"	.16	"	"	"	"	"
"		1	218	"	"	.10	"	"	"	"	"

Lake	Species	No.	Weight (g)	Contaminants (ppm)							
				ALDN	AS	DLDN	ENDN	HG	ISOD	DDE	DDT
L. Mary	C. Catfish	1	597	BDL	BDL	.16	BDL	BDL	BDL	BDL	BDL
"	"	1	746	"	"	.22	"	.35	"	"	"
"	L.M. Bass	2	170/156	"	2.10	.11	"	BDL	.03	.06	"
"	"	2	131/113	"	2.00	.10	"	.32	BDL	BDL	"
"	"	2	126/120	"	BDL	.03	"	BDL	"	"	"
"	"	2	125/124	"	2.10	.06	"	"	"	"	"
"	"	2	247/110	"	2.20	BDL	"	"	"	"	"
"	"	3	105/102/99	"	BDL	.08	"	.21	"	"	"
"	"	2	127/109	"	"	.03	"	.35	"	"	"

1/ All fish were caught on 6-10-80

Contaminant	Symbol	Detection Level (ppm)
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfide	PCPMS	0.20
Cpm-sulfone	CPM02	0.20
Cpm-sulfoxide	CPMSO	0.20
Dibromochloropropane	DBCP	0.02
Dichlorodiphenyldichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

CD, CPM02, PCPMS, DBCP, DIMP, DITH, CPMSO, and OXAT were all below detectable levels (BDL).

1981

TABLE I

Contaminants in Breast and Leg Meat of Pheasants
from RMA - 1981^{1/}

Location ^{2/}	Sex	Age	Contaminant (ppm) ^{3/}				HG
			CPM02	DIMP	DLDN	ENDN	
Section 01-11	M	Ad	BDL	BDL	0.04	BDL	1.20
01-11	M	Juv	BDL	BDL	0.16	BDL	0.23
06-05	F	Ad	BDL	BDL	0.04	BDL	BDL
06-05	M	Juv	BDL	BDL	0.02	0.02	0.32
24-10	M	Ad	BDL	BDL	BDL	BDL	0.26
24-10	M	Ad	BDL	BDL	BDL	BDL	BDL
31-13	M	Ad	BDL	BDL	BDL	BDL	BDL
26-06	M	Ad	BDL	0.10	0.06	BDL	BDL
26-06	M	Ad	BDL	0.10	0.02	BDL	BDL
26-11	M	Ad	0.36	0.34	2.83	0.03	BDL

^{1/} Taken 4-11 Sep 81

^{2/} Locations:

Section 01-11 North shore of Upper Derby
 06-05 North of Upper Derby arm
 24-10 North of sewage pond
 31-13 Northwest corner of section 31
 26-06 Just South of Basin F fence
 26-11 Just East of Basin F fence

^{3/} Contaminant	Symbol	Detection Level (ppm)
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfide	PCPMS	0.20
Cpm-sulfone	CPM02	0.20
Cpm-sulfoxide	CPMSO	0.20
Dibromochloropropane	DBCP	0.02
Dichlorodiphenyldichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

ALDN, AS, CD, CPMSO, DBCP, DDE, DDT, DITH, ISOD, OXAT and PCPMS were below their detection levels (BDL).

TABLE II

Contaminants in Breast and Leg Meat of Mallard
Ducks from RMA - 1981 ^{1/}

<u>Location</u>	<u>Sex</u>	<u>Age</u>	<u>Contaminant (ppm) ^{2/}</u>				
			<u>ALDN</u>	<u>DLDN</u>	<u>ENDN</u>	<u>DDE</u>	<u>DDT</u>
Lake Mary	F	Juv	BDL	BDL	BDL	0.21	BDL
" "	F	Juv	BDL	0.08	0.03	0.10	0.03
R&G Club Pond	M	Ad	BDL	0.97	0.03	BDL	0.03
" "	F	Ad	BDL	0.06	BDL	0.09	0.02
Pond, Sec 11	F	Juv	BDL	0.03	BDL	BDL	BDL
" "	F	Juv	BDL	0.04	0.03	0.03	0.02
Upper Derby	F	Juv	0.03	0.88	0.04	BDL	0.02
" "	F	Juv	BDL	0.68	BDL	BDL	0.02
Sewage Pond	F	Juv	0.02	0.42	0.02	BDL	0.02
" "	F	Juv	BDL	0.28	0.02	BDL	0.02

^{1/} Taken 3-11 Sep 81. All ducks assumed to be summer residents.

^{2/} See Table I for symbols. AS, CD, CPMO2, CPMSO, DBCP, DIMP, DITH, HG, ISOD, OXAT, and PCPMS were below their detection levels (BDL).

TABLE III

Contaminants in the Breast Meat of Mourning Doves
from RMA - 1981 ^{1/}

<u>Location</u> ^{2/}	<u>Sex</u>	<u>Age</u>	<u>CPM02</u>	<u>Contaminant (ppm)</u> ^{3/}		
				<u>DLDN</u>	<u>ENDN</u>	<u>DDE</u>
Section 02-10	?	Ad	0.22	0.24	0.03	BDL
02-10	?	Ad	BDL	0.22	0.03	BDL
04-02	?	Ad	BDL	BDL	BDL	BDL
04-02	?	Ad	BDL	BDL	BDL	BDL
12-14	?	Ad	BDL	BDL	BDL	0.03
12-14	?	Ad	BDL	BDL	BDL	BDL
35-13	?	Ad	0.22	BDL	BDL	BDL
35-13	?	Ad	BDL	BDL	BDL	BDL
26-11	?	Ad	0.53	3.40	0.30	BDL
26-11	?	Ad	2.53	9.96	1.21	BDL

^{1/} Taken on 31 Aug and 1 Sep 81.

^{2/} Locations:

Section 02-10	Between Lake Ladora and South plants area
04-02	Southwest corner of section 4
12-14	North of Rod & Gun Club pond
35-13	Northwest corner of section 35
26-11	East fence of Basin F

^{3/} See Table I for symbols. ALDN, AS, CD, CPMSO, DBCP, DDT, DIMP, DITH, HG, ISOD, OXAT and PCPMS were below their detection levels (BDL).

TABLE IV

Contaminants in the Meat of Cottontail Rabbits from
RMA - 1981 ^{1/}

<u>Location</u> ^{2/}	<u>Sex</u>	<u>Age</u>	<u>Contaminant (ppm)</u> ^{3/}		
			<u>CPM02</u>	<u>DLDN</u>	<u>HG</u>
Section 12-09	F	Ad	BDL	BDL	BDL
12-09	M	Ad	BDL	BDL	BDL
12-09	M	Ad	BDL	BDL	BDL
01-07	F	Ad	BDL	BDL	BDL
01-09	M	Ad	BDL	0.54	BDL
01-09	M	Ad	BDL	0.41	0.20
23-08	F	Ad	BDL	0.05	BDL
23-08	F	Ad	BDL	0.06	BDL
26-11	F	Ad	0.30	1.75	BDL
26-11	F	Ad	0.28	1.87	BDL

1/ Taken between 8 Oct and 4 Nov 81.

2/ Locations:

Section 12-09 Northwest corner of Section 12
 01-07 North shore of Upper Derby
 01-09 South plants area
 23-08 Southeast corner of section 23
 26-11 East of Basin F fence

3/ See Table I for symbols. ALDN, AS, CD, CPMSO, DBCP, DDE, DDT, DIMP, DITH, ENDN, ISOD, OXAT and PCPMS were below their detection levels (BDL).

TABLE V

Contaminants in Edible Portions (Filets) of Fish
from RMA - 1981 /¹

Lake	Species	No.	Wt(g)	DLDN	Contaminant / ²			
					ENDN	HG	ISOD	DDE
Lower Derby	L.M. Bass	1	275	0.03	BDL	0.44	BDL	0.05
"	"	1	325	BDL	BDL	0.63	BDL	0.03
"	N. Pike	1	286	BDL	BDL	0.49	BDL	0.03
"	"	1	208	BDL	BDL	0.45	BDL	BDL
"	"	1	549	0.06	BDL	0.49	BDL	0.03
"	"	1	883	0.12	BDL	1.04	BDL	0.03
"	"	1	690	BDL	BDL	0.45	BDL	BDL
"	"	1	718	0.10	BDL	0.76	BDL	0.03
"	"	1	1395	0.10	0.03	1.18	BDL	0.03
"	"	1	1873	0.08	0.03	1.00	BDL	0.07
"	"	1	344	0.31	0.04	0.76	BDL	BDL
"	B1 Bullhead	1	229	0.10	BDL	0.61	BDL	0.03
"	"	1	275	0.14	BDL	0.61	BDL	BDL
"	"	1	313	0.23	0.03	1.30	BDL	0.06
"	"	1	275	0.29	0.04	0.48	BDL	0.06
"	"	1	263	0.16	BDL	0.44	BDL	BDL
"	"	1	257	0.30	0.04	9.00	BDL	BDL
"	"	1	283	0.09	0.03	0.48	BDL	BDL
"	"	1	261	0.10	0.03	0.35	BDL	BDL
"	"	1	226	0.05	BDL	0.59	BDL	BDL
"	"	1	817	BDL	BDL	0.47	BDL	BDL
Ladora	L.M. Bass	1	736	0.05	BDL	0.46	BDL	BDL
"	"	1	692	0.06	BDL	BDL	BDL	BDL
"	"	1	644	0.03	BDL	BDL	BDL	BDL
"	"	1	118/45	BDL	BDL	BDL	BDL	BDL
"	N. Bluegill	2	89/42	BDL	BDL	BDL	BDL	BDL
"	"	2	88/38	BDL	BDL	BDL	0.05	BDL
"	"	4	40/25/37/32	0.03	BDL	BDL	0.19	BDL
"	"	1	3000	BDL	BDL	1.30	BDL	0.03
"	N. Pike	1	2750	BDL	BDL	1.10	BDL	0.03
"	"	1	2500	BDL	BDL	1.00	BDL	0.04
"	"	1	2000	0.03	BDL	1.10	BDL	0.03
"	"	1	229	BDL	BDL	0.23	BDL	BDL
"	B1 Bullhead	1	367	0.09	BDL	0.37	BDL	0.03
"	"	1	344	0.06	BDL	0.25	BDL	BDL
"	"	1	308	0.06	BDL	0.20	BDL	0.05
"	"	1	253	0.13	BDL	0.26	BDL	0.04
"	"	1	268	0.04	BDL	0.21	BDL	BDL
"	"	1	257	0.05	BDL	0.22	BDL	BDL
"	"	1	259	0.09	BDL	BDL	0.04	BDL
"	"	1	196	0.08	BDL	BDL	0.06	BDL
"	"	1	224	0.03	BDL	BDL	BDL	BDL

TABLE V

Contaminants in Edible Portions (Filets) of Fish
from RMA - 1981^{/1} (cont)

<u>Lake</u>	<u>Species</u>	<u>No.</u>	<u>Wt(g)</u>	<u>DLDN</u>	<u>ENDN</u>	<u>HG</u>	<u>ISOD</u>	<u>DDE</u>
Mary	L.M. Bass	1	112	BDL	BDL	BDL	BDL	BDL
" "	" "	1	103	0.05	BDL	0.59	BDL	BDL
" "	" "	1	119	0.03	BDL	5.85	BDL	BDL
" "	" "	1	106	0.08	BDL	0.59	BDL	BDL
" "	" "	1	101	0.03	BDL	0.63	BDL	BDL
" "	" "	1	85	0.06	BDL	0.51	BDL	BDL
" "	" "	1	100	0.03	BDL	0.59	BDL	BDL
" "	" "	1	100	BDL	BDL	0.58	BDL	BDL
" "	" "	1	98	0.06	BDL	0.55	BDL	BDL
" "	" "	1	103	BDL	BDL	0.57	BDL	BDL
" "	" "	1	119	BDL	BDL	6.55	BDL	BDL
" "	" "	1	115	BDL	BDL	0.57	BDL	BDL

^{/1} All fish were caught on 3 June 1981

^{/2} See Table I for symbols. ALDN, AS, CD, CPMO2, CPMSO, DBCP, DDT, DIMP, DITH, OXAT, and PCPMS were below their detection levels (BDL).

Contaminants in "Control" Game Birds - 1981

Control game bird samples consisting of five each of pheasants, mallard ducks and mourning doves collected off post by the Colorado Division of Wildlife were below detectable levels for all contaminants except 0.03 ppm endrin and 0.09 ppm DDE in one duck (an adult mallard taken on the South Platte river near 78th Ave).

1982

TABLE I
Contaminants in Breast and Leg Meat of Pheasants
from RMA - 1982 ^{1/}

<u>Location</u> ^{2/}	<u>Sex</u>	<u>Age</u>	<u>Contaminant (ppm)</u> ^{3/}	
			<u>CPM02</u>	<u>DLDN</u>
Section 26-14	M	Ad	1.00	0.12
26-14	M	Juv	0.73	0.08
26-14	M	Juv	0.57	0.04
26-14	M	Ad	0.56	0.06
24-04	M	Ad	BDL	BDL
24-04	M	Ad	BDL	BDL
24-10	M	Ad	BDL	BDL
24-10	M	Ad	BDL	BDL
01-11	M	Juv	BDL	BDL
01-11	M	Ad	BDL	BDL
01-11	M	Ad	BDL	BDL
07-09	M	Juv	BDL	BDL

^{1/}Taken 15-19 Aug 82

^{2/}Locations:

Section 26-14 Just north of Basin F fence
24-04 Southeast corner of section 24
24-10 North of sewage pond
01-11 North shore of Upper Derby
07-09 Highline canal, NW corner of section 7

<u>3/Contaminants</u>	<u>Symbol</u>	<u>Detection Level (ppm)</u>
Aldrin	ALDN	0.02
Arsenic	AS	2.00
Cadmium	CD	1.00
Chlorophenylmethylsulfide	PCPMS	0.20
Cpm-sulfone	CPM02	0.20
Cpm-sulfoxide	CPMSO	0.20
Dibromochloropropane	DBCP	0.02
Dichlorodiphenyltrichloroethylene	DDE	0.02
Dichlorodiphenyltrichloroethane	DDT	0.02
Dieldrin	DLDN	0.02
Diisopropylmethylphosphonate	DIMP	0.05
Dithiane	DITH	0.20
Endrin	ENDN	0.02
Isodrin	ISOD	0.02
Mercury	HG	0.20
Oxathiane	OXAT	0.20

ALDN, AS, CD, PCPMS, CPMSO, DBCP, DDE, DDT, DIMP, DITH, ENDN, ISOD, HG and OXAT were below their detection levels (BDL).

TABLE II
Contaminants in Breast and Leg Meat of Pheasants
from Off Post - 1982

<u>Date</u>	<u>Location</u>	<u>Sex</u>	<u>Age</u>	<u>Contaminant (ppm)</u> ^{1/}
				<u>DDE</u>
8-12-82	Weld Co.	?	Juv	BDL
8-12-82	Weld Co.	?	Juv	BDL
8-19-82	Weld Co.	F	Ad	0.03
8-19-82	Weld Co.	M	Ad	BDL
8-19-82	Weld Co.	F	Juv	BDL
8-19-82	Weld Co.	M	Juv	BDL
8-20-82	Adams Co.	M	Juv	BDL
8-20-82	Adams Co.	M	Juv	BDL
8-21-82	Adams Co.	M	Juv	BDL

1/See Table I for symbols. ALDN, AS, CD, PCPMS, CPM02, CPMS0, DBCP, DDT, DLDN, DIMP, DITH, ENDN, ISOD, HG and OXAT were below their detection levels (BDL).

TABLE III
Contaminants in Breast and Leg Meat of Ducks
from RMA - 1982 1/

<u>Location</u>	<u>Species</u>	<u>Sex</u>	<u>Age</u>	<u>Contaminant (ppm)</u> ^{2/}		
				<u>DLDN</u>	<u>ENDN</u>	<u>DDE</u>
North bog	Mallard	?	Juv	0.50	0.03	0.09
"	"	?	Juv	1.72	0.04	BDL
"	"	?	Juv	0.50	BDL	BDL
"	"	?	Juv	2.07	0.06	BDL
Pond, Sect 11	"	M	Ad	0.57	BDL	BDL
"	"	F	Ad	BDL	BDL	BDL
Uvalda ditch	"	?	Juv	0.03	BDL	BDL
"	"	?	Juv	BDL	BDL	BDL
Lower Derby	"	?	Juv	0.52	BDL	BDL
"	"	?	Juv	0.68	BDL	BDL
Sewage pond	"	M	Ad	0.62	0.06	BDL
"	Bl.W.Teal	F	Ad	0.16	BDL	BDL

1/Taken 5 Aug - 8 Sep 82. All ducks assumed to be summer residents.

2/See Table I for symbols. ALDN, AS, CD, PCPMS, CPM02, CPMS0, DBCP, DDT, DIMP, DITH, ISOD, HG and OXAT were below their detection levels (BDL).

TABLE IV
Contaminants in Breast and Leg Meat of Ducks
from Off Post - 1982

<u>Date</u>	<u>Location</u>	<u>Species</u>	<u>Sex</u>	<u>Age</u>	<u>DDE</u>	<u>Contaminant (ppm)</u> ^{1/}		
						<u>DDT</u>	<u>DLDN</u>	<u>HG</u>
8-11-82	Weld Co.	Mallard	M	Ad	0.09	BDL	BDL	BDL
"	"	"	M	Juv	0.11	BDL	BDL	BDL
"	"	"	M	Juv	0.12	BDL	BDL	BDL
"	"	"	M	Juv	BDL	BDL	BDL	BDL
"	"	"	F	Juv	0.11	BDL	BDL	BDL
"	"	"	F	Juv	BDL	BDL	BDL	BDL
9-4-82	"	"	F	Ad	BDL	BDL	BDL	BDL
9-5-82	Adams Co.	"	F	Ad	BDL	BDL	BDL	BDL
9-10-82	Weld Co.	"	F	Ad	BDL	BDL	BDL	BDL
"	"	"	F	Ad	BDL	BDL	BDL	BDL
"	"	Pintail	F	Ad	BDL	BDL	BDL	BDL
10-2-82	Adams Co.	Bl.W.Teal	F	Ad	0.04	0.05	0.07	2.00
"	"	"	F	Ad	BDL	BDL	BDL	BDL
10-30-82	"	Mallard	M	Ad	BDL	BDL	BDL	BDL

^{1/}See Table I for symbols. ALDN, AS, CD, PCPMS, CPM02, CPMS0, DBCP, DIMP, DITH, ENDN, ISOD and OXAT were below their detectable levels (BDL).

TABLE V
Contaminants in the Breast Meat of Mourning Doves
from RMA - 1982 1/

<u>Location</u> ^{2/}	<u>Sex</u>	<u>Age</u>	<u>Contaminant (ppm)</u> ^{3/} <u>DLDN</u>
Section 26-02	?	Ad	0.03
26-06	?	Ad	BDL
26-13	?	Ad	BDL
07-06	?	Ad	BDL
07-06	?	Ad	BDL
07-06	?	Ad	BDL
09-15	?	Ad	BDL
09-15	?	Ad	BDL
09-09	?	Ad	BDL
12-14	?	Ad	BDL
12-14	?	Ad	BDL
24-14	?	Ad	BDL
24-14	?	Ad	BDL
01-06	?	Ad	BDL
01-06	?	Ad	BDL

1/Taken 5-10 Aug 82

2/Locations:

Section 26-02 Between Basins C and D
 26-06 Between Basins C and F
 26-13 West fence of Basin F
 07-06 Highline canal, SW corner of Sect 7
 09-15 Northeast corner of Sect 9
 09-09 Northwest corner of Sect 9
 12-14 Rod and Gun Club pond
 24-14 Northwest corner of Sect 24
 01-06 Between Lower Derby and south plants area

3/See Table I for symbols. ALDN, AS, CD, PCPMS, CPM02, CPMS0, DBCP, DDE, DDT, DIMP, DITH, ENDN, ISOD, HG and OXAT were below their detection levels (BDL).

TABLE VI
Contaminants in Breast Meat of Mourning Doves
from Off Post - 1982

<u>Date</u>	<u>Location</u>	<u>Sex</u>	<u>Age</u>	<u>Contaminant (ppm)</u> ^{1/}
8-11-82	Weld Co.	?	Ad	0.03
"	"	?	Ad	BDL
"	"	?	Ad	BDL
"	"	?	Ad	BDL
8-14-82	Arapahoe Co.	?	Ad	0.03
"	"	?	Ad	BDL
8-21-82	Adams Co.	?	Ad	BDL
9-1-82	Weld Co.	?	Ad	BDL
9-6-82	Adams Co.	?	Ad	BDL

1/See Table I for symbols. ALDN, AS, CD, PCPMS, CPM02, CPMS0, DBCP, DDT, DLN, DIMP, DITH, ENDN, ISOD, HG and OXAT were below their detection levels (DBL).

TABLE VIII
Contaminants in Edible Portion (Filets) of Fish
from RMA - 1982 ^{1/}

Lake	Species	No.	Wt. (g)	Contaminant (ppm) ^{2/}				
				DLDN	ENDN	HG	DDE	DDT
Lower Derby	N. Pike	1	> 825	0.05	BDL	0.36	0.06	0.04
	"	1	> 836	0.11	BDL	0.53	0.05	0.05
	"	1	> 922	0.05	BDL	BDL	0.05	BDL
	"	1	866	0.07	BDL	0.74	0.14	BDL
	"	1	> 543	0.07	BDL	0.40	0.07	0.05
	"	1	> 2000	0.07	0.04	0.81	0.20	0.09
	"	1	633	0.04	BDL	0.61	0.08	BDL
	"	1	791	0.05	BDL	0.52	0.06	BDL
	"	1	> 1618	0.03	BDL	0.97	0.09	BDL
	"	1	> 1633	BDL	BDL	1.60	0.05	BDL
	"	1	> 1273	BDL	BDL	1.80	0.03	BDL
	"	1	> 1547	BDL	BDL	0.80	BDL	BDL
	"	1	> 1056	0.34	0.03	0.40	0.08	0.10
	L.M. Bass	1	173	0.06	BDL	0.25	BDL	BDL
	Bl. Bullhead	1	222	0.05	BDL	0.16	0.06	BDL
	"	1	239	0.11	0.03	0.39	0.11	BDL
	"	1	192	0.09	BDL	0.25	0.09	BDL
	"	1	211	0.05	BDL	0.56	BDL	BDL
	"	1	244	0.07	BDL	0.36	0.05	BDL
	"	1	155	BDL	BDL	0.47	BDL	BDL
	"	1	244	0.05	BDL	0.27	0.04	BDL
	"	1	216	0.10	BDL	BDL	0.06	BDL
	"	1	280	0.07	BDL	BDL	0.03	BDL
Ladora	N. Pike	1	6220	BDL	BDL	0.24	0.08	BDL
	"	1	2750	BDL	BDL	0.21	BDL	BDL
	"	1	7582	0.04	BDL	0.30	0.03	BDL
	"	1	4800	0.03	BDL	0.22	0.03	BDL
	"	1	5000	BDL	BDL	0.23	0.03	BDL
	"	1	3750	0.07	BDL	0.30	0.07	BDL
	"	1	3150	0.04	BDL	0.22	0.05	BDL
	"	1	2300	0.03	BDL	0.26	BDL	BDL
	L.M. Bass	1	1500	BDL	BDL	0.27	0.03	BDL
	"	1	790	0.03	BDL	0.49	0.03	0.03
	"	1	658	0.05	BDL	0.48	0.06	0.09
	"	1	632	BDL	BDL	0.48	BDL	BDL
	"	1	324	BDL	BDL	0.30	BDL	BDL
	"	1	57	0.05	BDL	BDL	BDL	BDL
	"	1	272	0.04	BDL	0.74	BDL	0.03
	Bl. Bullhead	1	250	0.07	BDL	0.76	BDL	0.03
	"	1	350	0.19	0.03	0.81	0.04	0.06
	"	1	206	BDL	BDL	0.72	BDL	BDL
	"	1	294	0.11	BDL	BDL	0.05	0.07
	"	1	351	0.09	BDL	0.75	0.05	BDL

TABLE VIII (continued)

Lake	Species	No.	Wt. (g)	DLDN	ENDN	HG	DDE	DDT
Ladora	Bl. Bullhead	1	322	0.13	BDL	BDL	BDL	0.04
"	"	1	355	0.04	BDL	BDL	BDL	BDL
"	"	1	311	0.14	0.03	BDL	0.09	0.08
"	"	1	270	0.24	0.03	0.54	0.07	0.06
"	N. Bluegill	6	1.7, 2.6, 3.8, 5.5, 6.3, 9.0	BDL	BDL	0.56	BDL	BDL
"	"	2	16, 29	0.04	BDL	0.47	BDL	BDL
"	"	2	91, 100	0.04	BDL	0.35	BDL	BDL
"	"	2	89, 98	0.04	BDL	0.44	BDL	BDL
"	"	2	72, 91	0.06	BDL	0.40	BDL	BDL
"	"	2	98, 102	0.06	BDL	BDL	0.03	BDL
"	"	2	70, 83	0.06	BDL	BDL	BDL	BDL
"	"	2	61, 64	0.07	BDL	BDL	BDL	BDL
"	"	2	74, 53	0.08	BDL	BDL	BDL	BDL
"	"	2	79, 72	0.15	BDL	BDL	0.03	BDL
Mary	L.M. Bass	1	112	0.05	BDL	BDL	BDL	BDL
"	"	1	130	0.05	BDL	2.50	BDL	BDL
"	"	1	116	0.06	BDL	0.24	BDL	BDL
"	"	1	140	0.07	BDL	0.24	BDL	BDL
"	"	1	126	0.08	BDL	0.22	BDL	BDL
"	"	1	124	0.16	BDL	BDL	BDL	BDL
"	"	1	111	0.05	BDL	0.30	BDL	BDL
"	"	1	141	0.04	BDL	0.22	BDL	BDL
"	"	1	117	0.05	BDL	BDL	BDL	BDL
"	"	1	123	0.04	BDL	0.22	BDL	BDL
"	"	1	135	0.04	BDL	0.39	BDL	BDL
"	"	1	120	BDL	BDL	BDL	BDL	BDL
"	"	1	98	0.05	BDL	0.19	BDL	BDL
"	"	1	130	0.04	BDL	BDL	BDL	BDL
"	"	1	127	0.04	BDL	BDL	BDL	BDL
"	"	1	107	0.11	BDL	BDL	BDL	BDL
"	"	1	118	0.10	BDL	BDL	BDL	BDL
"	"	1	117	0.12	BDL	0.22	BDL	BDL
"	"	1	106	0.08	BDL	BDL	BDL	BDL
"	"	1	113	0.04	BDL	0.39	0.03	BDL
"	Ch. Catfish	1	>1138	0.22	0.03	BDL	0.05	BDL

1/Caught 9-24 Jun 82

2/See Table I for symbols. ALDN, AS, CD, PCPMS, CPMO2, CPMSO, DBCP, DIMP, DITH, ISOD and OXAT were below their detection levels (BDL).

Contaminants in Mule Deer on RMA, 1977 - 1982

Contaminants in Mule Deer on RMA, 1977 - 1982

2/

Contaminants Found (ug/g)

Year	Cause of Death	Location	1/ Tissue(s)	ALDN	CD	CPM02	CPMSO	DBCP	DITH	DLDN	ENDN	HG	OXAT	DDE	DDT
1977	Hunting	Sect 05	F,M,L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	"	Sect 05	F,L	BDL	BDL	BDL	BDL	BDL	0.13	0.48	BDL	BDL	BDL	BDL	BDL
	"	Sect 08	F,M,L	BDL	BDL	BDL	BDL	BDL	BDL	0.21	BDL	BDL	BDL	BDL	BDL
	"	Sect 30	F,M,L	BDL	BDL	0.25	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	"	Sect 31	F,M,L	BDL	BDL	BDL	BDL	BDL	0.06	BDL	BDL	BDL	BDL	BDL	BDL
	"	Sect 32	F,L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.34	BDL
	"	?	F,M	0.10	BDL	BDL	BDL	BDL	0.10	BDL	BDL	BDL	BDL	0.22	BDL
1978	Euthanasia (broken leg)	Sect 32	{M B F}	BDL	BDL	BDL	BDL	0.03	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	"	Sect 12	{M L H}	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Shot (poached)	Sect 23	M	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1980	Euthanasia (broken leg)	Sect 23	M	BDL	1.35	BDL	BDL	BDL	BDL	BDL	BDL	0.23	BDL	BDL	BDL
1981	Roadkill	Sect 31	{M L}	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1982	Euthanasia (injured)	Sect 01	M	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Died of		{M L}	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	unknown			BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.26	0.91	BDL
	cause	Sect 01	{B F}	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
				BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.03

1/ F (fat) M (muscle), L (liver), B (brain), H (heart)

2/ AS, PCPMS, DIMP and ISOD were below detectable levels (BDL).

Summary of Contaminant Concentrations in Fish on RMA

1979 - 1982

Summary of Contaminant Concentrations in Fish on RMA (All Species) - 1979 - 1982

Samp Size Year Lake			A L D R I N			D I E L D R I N			No. of Fish Exc. FDA Action Level
			ug/g wet wt.		No. of Fish Exc. FDA Action Level	ug/g wet wt.		No. of Fish Exc. FDA Action Level	
			Mean(Std err)	Range		Mean(Std err)	Range		
Lower Derby	79	18	0.01(0.004)	Bdl*-0.05	0	0.36(0.04)	0.13-0.65	10(55%)	
	80	15	0.05(0.03)	Bdl -0.31	1(7%)	0.12(0.04)	Bdl-0.46	2(13%)	
	81	20	0	-	0	0.11(0.02)	Bdl-0.31	2(10%)	
	82	23	0	-	0	0.07(0.01)	Bdl-0.34	1(4%)	
	79	17	0	-	0	0.10(0.01)	0.04-0.20	0	
Ladora	80	18	0	-	0	0.10(0.02)	0.03-0.40	1(6%)	
	81	22	0	-	0	0.04(0.01)	Bdl-0.13	0	
	82	34	0	-	0	0.07(0.01)	Bdl-0.24	0	
	79	13	0.009(0.005)	Bdl-0.04	0	0.04(0.01)	Bdl-0.10	0	
Mary	80	9	0	-	0	0.09(0.02)	Bdl-0.22	0	
	81	12	0	-	0	0.03(0.01)	Bdl-0.08	0	
	82	21	0	-	0	0.07(0.01)	Bdl-0.22	0	
				E N D R I N			M E R C U R Y		
Lower Derby	79	18	0.06(0.03)	Bdl-0.50	2(11%)	0	-	0	
	80	15	0.02(0.01)	Bdl-0.14	0	0.31(0.03)	0.21-0.64	0	
	81	20	0	-	0	1.08(0.42)	0.35-9.00	5(25%)	
	82	23	0.004(0.002)	Bdl-0.04	0	0.53(0.09)	Bdl-1.80	2(9%)	
	79	17	0.004(0.002)	Bdl-0.03	0	0	-	0	
Ladora	80	18	0.003(0.002)	Bdl-0.03	0	1.27(0.83)	Bdl-15.3	3(17%)	
	81	22	0	-	0	0.33(0.09)	Bdl-1.30	4(18%)	
	82	34	0.003(0.002)	Bdl-0.03	0	0.31(0.04)	Bdl-0.81	0	
	79	13	0	-	0	0.08(0.04)	Bdl-0.32	0	
Mary	80	9	0	-	0	0.14(0.06)	Bdl-0.35	0	
	81	12	0	-	0	1.46(0.64)	Bdl-6.55	2(17%)	
	82	21	0.001(0.001)	Bdl-0.03	0	0.24(0.12)	Bdl-2.50	1(5%)	

* Bdl = Below detectable level